

**Background** Malaria in pregnancy remains a major public health problem in endemic areas of the sub-Saharan African (SSA) region. However, there is limited understanding of the role of women empowerment in using Sulfadoxine-Pyrimethamine for intermittent preventive treatment of malaria during pregnancy (IPTp-SP) in the SSA region. This study examines the association between women empowerment indicators and optimal uptake of IPTp-SP (3 or more doses) in the Lake endemic region of Kenya.

**Methods** We used data from a cross-sectional baseline survey of 3154 women aged 15–49 years in Kisumu and Migori Counties who had a live birth in the last two years prior to the study. Data were collected between June to August 2021. We conducted a descriptive analysis to show the distribution of respondents by key background characteristics, and bivariate and multivariate logistic regression to examine statistically significant associations between women empowerment measures (decision-making power, control of assets, education, and employment status) and optimal uptake of IPTp-SP.

**Results** Of the 3154 surveyed women, 1505 (47.7%) received optimal IPTp-SP dose during their last pregnancy. The Odds for optimal use of IPTp-SP increased among women who had: high decision-making autonomy (AOR=1.31; CI=1.10 – 1.58); 4 or more ANC visits (AOR=3.18; CI=2.64 – 3.84); interacted with a healthcare provider about IPTp (AOR=1.47; CI=1.27 – 1.71); and high knowledge of approaches to prevent malaria in pregnancy (AOR=1.99; CI=1.62 – 2.45).

**Conclusion** The study findings suggest that maternal health interventions should focus on less empowered women (i.e. women with less decision-making autonomy), women with limited ANC visits and interaction with a healthcare provider, and those with limited knowledge of approaches to prevent malaria in pregnancy because they are less likely to achieve optimal use of IPTp-SP dose during pregnancy.

PA-693

#### RECOVERY OF FULL SUSCEPTIBILITY TO DELTAMETHRIN OF RESISTANT MOSQUITOES AFTER PRE-EXPOSURE TO PIRERONYL BUTOXIDE: A CALL FOR THE USE OF SECOND GENERATION NETS IN GABON

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**Background** Bed nets are the main tools used in vector control of malaria. However, insecticide resistance is a looming threat on their efficacy and the gains obtained over the years. Thus, a better understanding of the resistance profile of vectors is a prerequisite towards the implementation of vector control measures adapted to local settings. We therefore aimed to evaluate the resistance of mosquitoes to various insecticides and the effect of the synergist piperonyl butoxide (PBO) on pyrethroid resistance.

**Methods** *Anopheles gambiae* s.l. larvae were collected in Lambaréné and reared until adult emergence. The susceptibility of adult mosquitoes to deltamethrin, permethrin, bendiocarb and malathion was tested using the WHO protocol with additional testing performed for permethrin and deltamethrin with mosquitoes pre-exposed to PBO.

**Results** *An. gambiae* s.l. mosquitoes were resistant to permethrin 0.75% and deltamethrin 0.05% with mortalities of 11% and 72% respectively, after 24 hours. Resistance to permethrin was of high intensity with mortality of 47% with permethrin 3.75% and 88% with permethrin 7.5%. The combination PBO+permethrin 0.75% resulted in a 4-fold increase in mortality to 44%. The intensity of resistance to deltamethrin is considered moderate with a mortality with deltamethrin 2.5% of 86% in the tests performed. The combination PBO+deltamethrin 0.05% resulted in a complete recovery of susceptibility with a mortality of 100%. Finally, mosquitoes were resistant to bendiocarb and susceptible to malathion with mortalities of 75% and 100% respectively.

**Conclusion** The results obtained in this study confirm the high intensity of resistance of *Anopheles* to pyrethroids. However, the improvements observed with the use of PBO in terms of mortality rates suggest that second generation bed nets which are impregnated with PBO could be useful tools for vector control. These results also allow us to consider the use of malathion in combination with other insecticides to mitigate resistance.

PA-698

#### BABIES BORN TO MOTHERS WITH ACTIVE TUBERCULOSIS (TB) HAVE REDUCED IGG TETANUS AND DIPHTHERIA VACCINES RESPONSES AND INCREASED IL-17 PRODUCTION

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**Background** Babies born to mothers with active TB (ATB) are at risk of poor clinical outcomes like low birth weight however, little is known about their vaccine responses. We hypothesised that these babies have reduced responses to vaccines compared to babies born to TB-free mothers.

The objectives of this study were i) to determine IgG responses to: BCG, measles, tetanus, and diphtheria vaccines and ii) to determine TB-specific cytokine responses using QuantiFERON (QFT) plasma.

**Methods** A longitudinal case-control study; baby-cases (born to mothers with bacteriologically confirmed ATB) and baby-controls (born to mothers without ATB). Quantitative IgG-specific BCG, diphtheria, tetanus, and measles ELISA assays were performed on infant plasma harvested from heparinised venous blood collected on first encounter after birth (month 0), at month 3 and month 6 following immunisation as per the Uganda routine immunisation schedule for children under 1 year. Luminex (5-plex) assay for TB-specific cytokines: IL-17/IL17A, IFN- $\gamma$ , TNF- $\alpha$ , IL-2 and GM-CSF was also performed on baby QFT plasma. Prism was used for statistical analysis, and  $P < 0.05$  was considered statistically significant after performing the Mann-Whitney U-test. Data was expressed as medians and interquartile ranges. Fold changes were computed by dividing medians of cases by medians of controls.

**Results** Fold change analysis revealed that cases had a 0.15-fold decrease in diphtheria antibodies and a 0.69-fold decrease

in tetanus antibodies compared to controls ( $p=0.0281$ ) ( $p=0.0122$ ) respectively. No significant difference in BCG and measles antibodies was observed among cases and controls ( $p=0.9999/p=0.6568$ ) respectively. Also, a 1.23-fold increase in IL-17/IL-17A cytokine response among cases was observed compared to controls ( $p=0.0142$ ). Finally, no significant difference in IFN- $\gamma$ , TNF- $\alpha$ , IL-2 and GM-CSF cytokine responses was observed ( $p=0.4811/p=0.8064/p=0.1668/p=0.3881$ ) respectively.

**Conclusion** Maternal ATB reduces infant diphtheria and tetanus vaccine responses and causes a 1.23-fold increase in IL-17/IL-17A cytokine responses among exposed infants. Further studies are required to determine the later life response outcomes.

**PA-699** **IMPACT OF SIX-MONTH INTERVAL PRAZIQUANTEL TREATMENT ON THE PREVALENCE OF UROGENITAL SCHISTOSOMIASIS AT VILLAGE LEVEL IN THE SENEGAL RIVER BASIN**

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**Background** Schistosomiasis is a parasitic disease responsible of important morbidity and mortality in sub-Saharan endemic countries. In Senegal, national schistosomiasis control and elimination program has initiated since 2012, annual repeated praziquantel (PZQ) mass drug administration (MDA) in endemic regions in the Senegal River basin (SRB). The impact of annual MDAs is assessed at the health district level. However, considering the focal characteristic of the disease transmission, huge disparities exist at the lowest levels, such as village or contamination site.

**Methods** This study consisted in following the *Schistosoma haematobium* infection using microscopic method in a cohort of school-age children in five villages in the SRB. Baseline prevalence was evaluated in August 2020 then 40 mg/kg of PZQ was administered. Six month after, the prevalence and reinfection were evaluated and a second treatment was administered in March 2021 following by a second prevalence and reinfection evaluation six months after.

**Results** At the baseline, very high prevalence was observed in the villages of Guia (91.2%) and Khodit (90.6%) with Human frequenting irrigation canal while moderate prevalence was noted in the village of Ndiawara (45%), and Dioundou (49%) with Human frequenting the river and also in the village of Mbane (43.1%) near the Lac de Guiers. After two six-months interval treatment, prevalence of *Schistosoma haematobium* was reduced in all the villages with the lowest reinfection rates noted in children frequenting the Senegal river (25.5%) and the lac de Guiers (36%), while the villages near the irrigation canal, remain hotspots with higher rates of reinfection in children (58%).

**Conclusion** This study suggests to adapt the periodicity of the MDA in the SRB at a 6-month interval in the villages near

the irrigation canals, while maintaining the annual treatment in the other villages in accordance with the WHO guideline on control and elimination of schistosomiasis.

**PA-700** **INVESTIGATING THE UTILITY AND ADDED VALUE OF NON-SPUTUM-BASED APPROACHES FOR DIAGNOSIS OF TUBERCULOSIS IN WEST AFRICAN CHILDREN: A STUDY UPDATE**

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**Background** Childhood tuberculosis (TB) accounts for 12% of the 10.6 million incident cases of TB globally, and 16% of all TB-related mortality. The majority of childhood TB cases and deaths occur in TB-endemic countries where difficulties with confirming TB diagnosis with conventional sputum-based approaches contribute to poor outcomes. We present the methodological approaches and progress report from a study investigating the added value of non-sputum-based approaches for the diagnosis of TB in children in West Africa.

**Methods** This is a multi-country study recruiting children (age <15 years) with presumptive pulmonary TB at study sites in The Gambia, Ghana, and Benin. Participants undergo standardised conventional clinical, radiologic and microbiological investigations for TB diagnosis. In addition, early morning stool samples are simultaneously collected for testing with Xpert Ultra ('stool Xpert'), while Computer-aided Detection for TB-version 7 ('CAD4TBv7'; Delft Imaging, Netherlands) abnormality score are derived for their digital chest radiographs (CXR). Bayesian latent class analysis will be used to determine the added value of the non-sputum-based tests in term of relative increases in sensitivity and specificity by combining CAD4TBv7 and stool Xpert results with conventional methods.

**Results** Recruitment and investigation of eligible study participant have commenced at the three study sites, with more than 100 children enrolled from January 2023 till date. The CAD4TBv7 system has been set up at the Gambia study site. Digital CXR from the two other study sites are de-identified and transferred electronically to The Gambia, using an encrypted internet-based file transfer software, for CAD4TBv7 scoring. A blinded senior radiologist also provides independent assessment of the likelihood of TB on each CXR.

**Conclusion** This study presents an opportunity to objectively determine how many additional childhood TB cases can be detected if CAD4TBv7 abnormality score and stool Xpert are combined with conventional diagnostic tests.

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